



CONGRESSIONAL BUDGET OFFICE  
U.S. Congress  
Washington, DC 20515

*Douglas W. Elmendorf, Director*

April 25, 2011

Honorable C.W. Bill Young  
Chairman, Subcommittee on Defense  
Committee on Appropriations  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

In response to a request by the Subcommittee on Defense, the Congressional Budget Office (CBO) has examined ways to establish a clearer relationship between the readiness of the armed forces and operation and maintenance spending by the Department of Defense. CBO's analysis is attached.

I hope that you find this information helpful. The staff contact for the analysis is Adebayo Adedeji.

Sincerely,

A handwritten signature in black ink that reads "Douglas W. Elmendorf".

Douglas W. Elmendorf

Attachment

cc: Honorable Harold Rogers  
Chairman, House Committee on Appropriations

Honorable Norman D. Dicks  
Ranking Member, House Committee on Appropriations

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## CONGRESSIONAL BUDGET OFFICE

# Linking the Readiness of the Armed Forces to DoD's Operation and Maintenance Spending

April 2011

Spending for operation and maintenance (O&M) supports the military services' day-to-day activities, such as the training of military units, maintenance of equipment, recruitment of service members, operations of military bases, and provision of administrative services. In 2010, appropriations for O&M (excluding funds for the Defense Health Program) totaled \$157 billion and constituted some 29 percent of the Department of Defense's (DoD's) "base" budget.<sup>1</sup>

DoD typically cites the readiness of military units to perform their missions in wartime as the primary justification for its O&M budget requests to the Congress. For example, budget materials that the Army submitted with its 2012 request for O&M funding state the following: "The budget provides resources to train and sustain the active component combat forces at readiness levels consistent with mission requirements. . . ."<sup>2</sup> The Navy in part justified its 2012 O&M request with this statement: "Our top readiness priority is ensuring that forces are fully trained, ready to deploy, and fully supported while deployed. The budget reflects the best balance of resources to achieve this priority."<sup>3</sup>

DoD broadly defines "readiness" as the ability of U.S. military forces to fight and meet the demands of the National Military Strategy (which describes the armed forces' role in achieving national security objectives). DoD assesses readiness on at

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1. DoD's base budget supports the ordinary activities of the department, such as development and procurement of weapon systems and the day-to-day operations of the military and civilian workforces. DoD also receives additional funds to pay for the wars in Afghanistan and Iraq and for other contingency operations. Those funds are counted in the budget totals but are not considered part of DoD's base budget.
  2. Department of the Army, *Fiscal Year (FY) 2012 Budget Estimates*, vol. 1, *Operation & Maintenance, Army: Justification Book* (February 2011), p. 5, [www.asafm.army.mil/Documents/OfficeDocuments/Budget/BudgetMaterials/FY12/opmaint//oma-v1.pdf](http://www.asafm.army.mil/Documents/OfficeDocuments/Budget/BudgetMaterials/FY12/opmaint//oma-v1.pdf).
  3. Department of the Navy, Office of Budget, *Highlights of the Department of the Navy FY 2012 Budget* (February 2011), p. 4-3, [www.finance.hq.navy.mil/FMB/12pres/Highlights\\_book.pdf](http://www.finance.hq.navy.mil/FMB/12pres/Highlights_book.pdf).

least two levels—the unit level and the joint level.<sup>4</sup> “Unit readiness” is the ability of units such as Army brigades, Marine Corps regiments, Navy ships, and Air Force squadrons to perform their designated missions. “Joint readiness” refers to a commander’s ability to execute missions with units from more than one service.

DoD, however, has not been able to clearly identify the relationship between the department’s O&M spending and the readiness of military units. Nor has the Congressional Budget Office’s (CBO’s) analysis—which used historical data to attempt to establish statistical relationships between O&M spending and readiness for selected units—yielded a well-defined linkage. (CBO’s analysis focused only on unit readiness because of the role it plays in DoD’s assessments of the services’ need for O&M funding.) Those efforts were not fruitful, largely because the information needed to determine that linkage—effective measures of readiness and detailed data on spending—is not readily available or may not, in fact, exist. The military’s current measures of readiness are not readily applicable to such analyses, and there are some concerns about the quality of its assessments of readiness.

Yet even if readiness were well measured, determining the relationship between readiness and O&M spending presents challenges. Some activities supported by O&M spending may be more directly related to a unit’s current readiness than other such activities are; in addition, some spending from other types of appropriations may affect readiness. Also, spending intended to support units’ readiness activities must be distinguished from spending for overseas contingency operations (for example, in Iraq and Afghanistan). If DoD is to determine how O&M spending affects units’ readiness, it may have to conduct controlled experiments in which it methodically varies readiness-related spending for otherwise similar units.

## **Trends in Operation and Maintenance Spending**

In its budget requests, DoD divides O&M activities into four categories—operating forces, mobilization, training and recruiting, and administration and servicewide activities—that reflect the activities’ major mission or function.<sup>5</sup> To focus on readiness, CBO consolidated the spending for those activities into two categories:

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4. See Joint Chiefs of Staff, *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02 (April 2001; as amended through August 19, 2009), pp. 454–455. DoD and other experts also consider “strategic readiness,” a synthesis of unit and joint readiness that describes the ability of the armed forces as a whole (including the services, the combatant commands, and combat support agencies) to fight and meet the demands of the National Military Strategy. (A combatant command is composed of forces from two or more services and has a broad and continuing mission.)
  5. DoD also requests funds for O&M activities within the Defense Health Program, but CBO excluded that program from its current analysis because the program is not directly related to units’ training and readiness.

- **Mission-related spending** for training and for maintaining the equipment of forces that may ultimately deploy in a conflict. The category includes spending for operating forces and mobilization activities (but excludes costs related to the operation of military bases—such as for cleaning, landscape maintenance, and utilities). In CBO’s judgment, mission-related spending is more directly linked to units’ readiness than is other O&M spending.
- **Infrastructure-related spending** for the deployable forces described above. The category comprises spending for DoD’s training and recruiting activities (which includes the individual skills training that is typically conducted in the classrooms of the military services’ training schools) and for administration and servicewide activities (central functions such as human resources management and certain intelligence programs). It also includes funds for operating military bases drawn from all four of DoD’s O&M categories.

In total, O&M spending in DoD’s base budget, measured in 2011 dollars, rose from \$128 billion in 2000 to \$157 billion in 2010, an increase of 23 percent above inflation. (All spending presented in this CBO analysis is expressed in 2011 dollars.) Mission-related spending accounted for slightly more than half of the growth, rising by 26 percent—from \$56 billion in 2000 to \$71 billion in 2010 (see Table 1). Infrastructure-related spending grew by 20 percent over the same period—from \$72 billion in 2000 to \$86 billion in 2010.

To assess longer-term trends, CBO examined O&M spending per active-duty service member, so as to remove the effects that increases in the overall size of the force structure had on such trends. Between 1980 and 2001, O&M costs per active-duty service member climbed steadily, rising by an average of about \$1,700 annually (see Figure 1).<sup>6</sup> Increasing costs for fuel, pay raises for civilian DoD workers, and the maintenance of aging weapon systems account for some—but not all—of that long-term growth. However, the source of the remaining growth is not easy to identify—at least not with the data that DoD regularly provides to the Congress in the budgeting process.

Since 2002, O&M spending per active-duty service member has risen more rapidly than that \$1,700-per-year trend. The wars in Iraq and Afghanistan have led to modest increases in the number of active-duty military personnel but large hikes in the amount of O&M funding per active-duty service member: In 2010, those additional funds boosted DoD’s total O&M spending (excluding spending for the Defense Health Program) by 70 percent above its base budget amount. Those increases were the result of the cost of conducting major operations on the other side of the world,

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6. The rate of increase in O&M costs per active-duty service member is greater if spending for the Defense Health Program is included—an average annual increase of \$2,200. For additional discussion, see Congressional Budget Office, *Long-Term Implications of the 2011 Future Years Defense Program* (February 2011), Box 2-1.

**Table 1.**

## Operation and Maintenance Appropriations, Excluding Those for the Defense Health Program, in DoD's Base Budget for 2000 and 2010

(Billions of 2011 dollars)

	2000	2010	Percentage Change Between 2000 and 2010
Mission-Related Appropriations <sup>a</sup>			
Operating forces	51	67	29
Mobilization	5	5	-6
Subtotal	56	71	26
Infrastructure-Related Appropriations			
Training and recruiting	10	13	20
Administration and servicewide activities	45	46	1
Support for military bases	16	28	70
Subtotal	72	86	20
<b>Total</b>	<b>128</b>	<b>157</b>	<b>23</b>

Source: Congressional Budget Office based on data from the Department of Defense (DoD).

Notes: DoD submits an annual request to the Congress for operation and maintenance funding for its base budget, which supports the ordinary activities of the department, such as development and procurement of weapon systems and the day-to-day operations of the military and civilian workforces. DoD also requests additional funds to pay for the wars in Afghanistan and Iraq and for other such contingency operations. Those funds are not considered part of the base budget.

a. Excludes support for military bases.

the exceptional wear and tear on equipment in combat, and the large number of reserve and National Guard personnel deployed.<sup>7</sup> The extent to which DoD will continue to receive such additional funds will depend on future overseas contingency operations, the number and scope of which are uncertain.

## Measuring the Readiness of Military Units

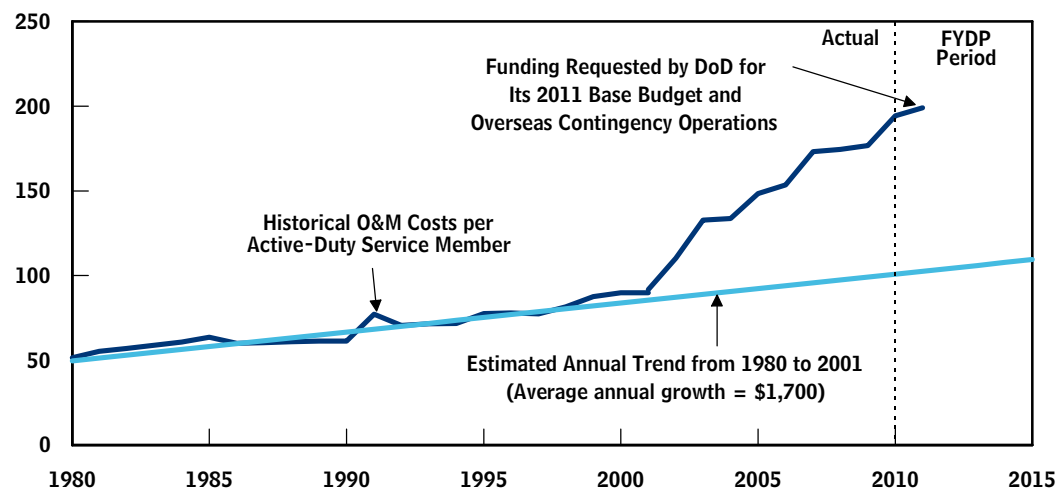
Measuring unit readiness requires an assessment of the resources of military units and their ability to perform their missions—which may involve both the completion of a set of well-defined tasks and a general preparedness for adapting to new circumstances. A common way of assessing a unit's readiness is to use a rater—someone

7. CBO did not include reserve and National Guard personnel in calculating O&M costs per active-duty service member, but their support nevertheless adds to such costs. (That is, in calculating that ratio, CBO did not include the number of reserve and National Guard personnel in the denominator but did reflect the costs to support them in the numerator.)

**Figure 1.**

## Operation and Maintenance Costs, Excluding Those for the Defense Health Program, per Active-Duty Service Member

(Thousands of 2011 dollars)



Source: Congressional Budget Office.

Notes: The Department of Defense (DoD) submits an annual request to the Congress for operation and maintenance (O&M) funding for its base budget, which supports the ordinary activities of the department, such as development and procurement of weapon systems and the day-to-day operations of the military and civilian workforces. DoD also requests additional funds to pay for the wars in Afghanistan and Iraq and for other such contingency operations. Those funds are not considered part of the base budget. The Future Years Defense Program (FYDP) is a five- or six-year plan associated with DoD's annual budget request.

Historical costs exclude those for the Defense Health Program and for elements within the FYDP that were consolidated in 1993 when DoD began budgeting separately for the Defense Health Program.

trained to grade a unit's performance by judging the extent to which it can undertake the tasks essential to its mission. Raters generate more reliable information—reliable in the sense that another rater would have given the same grade when observing the same performance—when they are not members of the unit, when they observe many units, and when the tasks they must assess are well defined.

Military forces most need a high degree of readiness at the time they deploy. The capacity to attain such readiness quickly is valuable, but units are not generally expected to maintain it at all times. The period immediately before units deploy is the point at which comparison ratings are most informative: All deploying units intend then to be at their maximum level of readiness, and by that time the missions relevant to the deployment have been clearly defined. However, recent deployments to Iraq and Afghanistan have illustrated the importance of adaptability as well. For example, armor units may be deployed as infantry and operate without the tanks that usually accompany them. In that case, ratings of the units' readiness to carry out infantry-related tasks would be most important before deployment, even though the unit would in general be focusing during its training on tasks involving the use of tanks.



Measuring readiness can be time-consuming, requiring trade-offs between the time a unit spends on such assessments and the time it allocates to other demands. At the Army's National Training Center (NTC) and Joint Readiness Training Center (JRTC), only a small number of units can be rated each year in training exercises in which they are opposed by another force.<sup>8</sup> Such exercises provide valuable information about readiness; however, it would be extremely costly to expand them so that large numbers of units could be evaluated every year. One way to reduce the resources needed for evaluating readiness and still give some feedback to each unit would be to limit the ratings given to all units to a small subset of representative tasks. Alternatively, DoD could assess overall readiness in greater depth by selecting a sample of units from among those nearing a scheduled deployment and conducting a comprehensive evaluation of their readiness. Another factor that complicates such assessments, however, is that the measured readiness of a group of units as a whole may depend disproportionately on a few units within the group. (For example, in a carrier strike force, the readiness of an aircraft carrier may be more critical than that of a support ship.) As a result, in assessing overall readiness in the armed forces, the most useful evaluative approaches and methods of combining the ratings of different kinds of units are not clear.

DoD's main measure of units' readiness is the Status of Resources and Training System (SORTS), which uses quantitative indicators and the judgment of units' commanding officers to assess whether units have the personnel, equipment, training, and supplies they need to go to war. For example, the system's ratings include an overall readiness rating (called a C-rating) and one for a unit's training (T-rating), which indicates a unit's ability to perform its mission-essential tasks.<sup>9</sup> To be rated T-1 (the top rating), a unit must be able to perform at least 85 percent of its mission-essential tasks. (The percentage cutoffs for the other T-ratings are 70 to 84 for T-2, 55 to 69 for T-3, and below 55 for T-4.)

DoD has revised SORTS by adding information management features, among others. The resulting system, the Enhanced Status of Resources and Training System (ESORTS), allows users to assign missions to units and formulate a list of tasks essential to accomplishing those missions. The units' ability to perform the tasks is then rated and reported. (ESORTS uses categories and color codes that include green for

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8. One of the objectives of the NTC and JRTC is to provide battalions and brigades with realistic training that includes live fire and force-on-force engagements, which are not usually possible at units' home stations.

9. SORTS also includes ratings for three other underlying "resource areas" in addition to training: the personnel "fill," or P-rating (the percentage of authorized personnel that the unit has on hand); the equipment fill, or S-rating (the percentage of authorized equipment that the unit has on hand); and the condition of the equipment, or R-rating (the proportion of combat-essential equipment and other such items that are "fully operational to perform wartime missions").

“Yes,” yellow for “Qualified Yes,” and red for “No,” as well as the traditional SORTS ratings—for example, C-1 to C-4 and T-1 to T-4.)<sup>10</sup>

The information from SORTS and ESORTS is of limited value in measuring readiness, for several reasons:

- The ratings are done under the supervision of units’ commanding officers, who are not independent observers;
- The time at which the ratings would, in principle, be most informative (immediately before a unit deploys) is the time at which the incentives for commanding officers to rate the unit as fully ready are the strongest—because the unit cannot deploy if the rating is too low; and
- The tasks that are evaluated may not accurately reflect the units’ wartime roles. (For example, units designed for traditional armored combat are currently deployed to Afghanistan to undertake the very different mission of counter-insurgency. Their standard mission-essential tasks may not match the new mission well.)

The information about readiness that DoD regularly provides to the Congress as part of its budget requests is, for the most part, different from what SORTS provides and even more limited. In most cases, the budget requests describe the size of forces (for example, the personnel levels and number of pieces of major equipment) or the “output” produced (the number of tons of equipment shipped, for instance). The measure used for field training of operational units—known as operational tempo, or optempo—is included in the requests, but it describes the units’ activities only generally (for example, in terms of underway days for ships, flying hours for aircraft squadrons, and miles driven by tanks or other vehicles for ground units). How those metrics relate to the readiness levels in SORTS is not specifically stated in many of the requests. In short, the information in DoD’s budget requests constitutes an assessment of some of the activities that could lead to a high degree of readiness among units but does not directly reflect the units’ ability to perform their missions. That lack of data leaves policymakers without the means to judge whether an increase or decrease in those activities would affect units’ readiness.

## **Identifying DoD’s Operation and Maintenance Spending for Unit Readiness**

Even if the readiness of the military services’ various units could be measured effectively, the challenge of estimating the linkage between readiness and DoD’s O&M

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10. DoD continues to revise its readiness reporting and is in the process of implementing the Defense Readiness Reporting System, which incorporates ESORTS and is designed to provide more-detailed information about each unit’s resources and training. That new system is the subject of a forthcoming CBO study and is not discussed here.

spending would remain. That challenge derives in part from the difficulty of identifying the amounts of money that DoD is allocating to activities intended to enhance readiness.

The activities that O&M spending supports differ in how closely tied they are to readiness. CBO identified a portion of O&M funding that it considered mission related and thus more directly linked to readiness than other O&M spending. Nevertheless, infrastructure-related spending also supports readiness, albeit less directly. Moreover, some aspects of units' readiness are related to funding for purposes other than O&M. For example, a unit's total resources for personnel depend on funds from the military personnel appropriation, and whether a unit has sufficient tanks or trucks reflects current and historical appropriations for procurement.

Identifying the total amount that DoD spends on unit readiness is also complicated by the ongoing operations in Iraq, Afghanistan, and other countries. The historical data that DoD provides to the Congress about actual O&M spending commingles the funding appropriated for those overseas contingency operations with the money appropriated for the base (nonwar) budget. The additional funding for those operations has supported U.S. military forces overseas by covering costs for food, housing, and security; fuel, spare parts, and maintenance for military equipment; transportation of personnel and equipment to and from the theater of operations; and other services. Those costs are incurred primarily because the units are deployed for operations overseas; the funds are not, for the most part, intended to promote readiness. Commingling that additional spending with base budget appropriations in the reported data makes it particularly difficult to identify how much DoD has spent on readiness-related activities during the past eight years.

## **Using Empirical Methods to Estimate How Changes in Operation and Maintenance Spending Might Affect Unit Readiness**

Better information about the relationship between the amount of O&M spending and military units' readiness would enable policymakers to make more-informed decisions about the types and amounts of funding to provide for O&M during the appropriation process. One avenue for providing such information is through statistical analyses that examine the effects on readiness of changes in O&M spending. Studies of that kind are complicated, however, because previous assessments of readiness may affect the spending allocated to each unit. For example, a preliminary assessment of a unit's readiness for deployment may have indicated some gaps. DoD might then direct more resources to that unit to boost its readiness in time for its deployment, transferring the resources from a unit whose preliminary assessment indicated a high level of readiness. As a result of the transfer, DoD could consider both units to have a high degree of readiness before deploying, and there would be no observed correlation of readiness with overall spending. Yet it would be a mistake to conclude that spending in such a case did not matter.

CBO found evidence that was consistent with such shifting of resources in its statistical analyses of the factors associated with training ratings in SORTS. In particular, the imminence of deployment was more strongly associated with units' readiness than were other factors (such as underway days for ships, expenditures on materials that the units consumed, or hours spent in maintaining their equipment). That is, units tended to increase their training and improve their T-ratings as their deployment date approached. That finding is consistent with DoD's often-observed practice of giving units with an upcoming deployment priority in securing resources for training and supplies. That practice, though sensible, complicates statistical analyses to isolate the effects of overall O&M spending on readiness.

To accurately identify those effects at the unit level, DoD would have to compare the readiness of otherwise similar units that received different amounts of O&M funding. DoD could measure the contribution to readiness as, say, the increase in the percentage of mission-essential tasks completed per million dollars of spending. If the amounts available to otherwise similar units were methodically varied for reasons unrelated to their readiness, DoD could then determine the contributions made by different types of spending. For example, spending for training that involved driving a tank some specified number of miles might enhance readiness, whereas spending for training that involved continuing to drive the tank for additional miles might have less of an effect. Such information would have immediate value to DoD if the department used it to reallocate funding more efficiently among its units and training programs and thus enhance the total performance of all of them.

The military services conduct exercises or similar kinds of training activities during which a unit is formally evaluated by staff from its higher-level headquarters. (An example is the large-scale force-on-force training conducted at the Army's National Training Center.) The scenarios employed in that training are usually tailored to emphasize areas of particular interest to the unit's commander. If, for units with varying amounts of training resources, DoD combined realistic training scenarios with a rigorous, comprehensive evaluation of a unit's performance, those exercises could illustrate how changes in the resources available to a unit would affect its readiness.

The Army, for example, could measure the effect of training resources on readiness in different ways. It could identify the natural variation in the training resources that units receive at their home stations in the period leading up to their NTC rotation and measure the level of proficiency in particular mission-essential tasks that they display at the NTC. The Army could then analyze the relationship between the resources that the units used before their visit to the center and their demonstrated performance. It is unclear, however, whether the quality of the data produced by studying that natural variation in resources would be sufficient to determine a linkage to readiness. Alternatively, the Army could explicitly vary the resources provided to some units at their home stations and measure the effects on their performance at the NTC. The other military services have similarly realistic multiunit training exercises that

might offer a setting for measuring the effects on readiness of varying levels of resources.

Other parts of the federal government use empirical methods to assess the effectiveness or capacity of programs to achieve their stated goals. Researchers in other federal agencies have conducted experiments that apply policy interventions—such as a change in the amount of certain resources—to groups of people and then formally evaluated the degree to which those interventions led to different outcomes among the groups. (For example, the Institute of Education Sciences evaluates the effectiveness of federal and other education programs and collects that information in its online What Works Clearinghouse. The Department of Labor maintains a research and evaluation inventory and an online library of studies of the effectiveness of its job training and other programs.)<sup>11</sup> In other instances, such evaluations are specified in legislation, as was the case with the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000. (That law mandated a so-called demonstration project to test the effects of providing varying financial incentives to group practices of physicians to improve the quality and efficiency of the care they deliver to their Medicare patients.) DoD could adapt the body of knowledge gained from such research and apply it to assessments of the readiness of military units.

Given the complexities of military combat, the wide variety of mission-essential tasks that the armed forces undertake, and the range of conditions under which those tasks might be performed, measurements of military readiness may be more complicated than the measurements mentioned in the examples above. To better understand the factors that promote readiness, policymakers could direct DoD through legislation to conduct an independent evaluation of the subject (that is, by an entity that is not part of DoD) and report the results. In the past, the Congress has asked DoD about the effects that boosting the O&M funds for operational tempo might have on the readiness of U.S. forces. The type of information and analyses discussed in this document could enable DoD to better respond to such inquiries.

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11. Additional information can be found at Institute of Education Sciences, <http://ies.ed.gov>; and Department of Labor, “Research and Evaluation Inventory and Documents Library,” [www.dol.gov/asp/programs/reidl/](http://www.dol.gov/asp/programs/reidl/).